

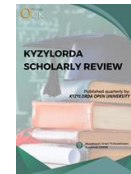
Evaluating the Impact of Real-Time Data Processing in Electronic Accounting Information Systems on Financial Decision-Making

Hisham Noori Hussain Al-Hashimy

College of Computer Science and Information Technology, University of Basrah, Iraq

Abstract. This study emphasises the real-time data in electronic accounting information systems (EAIS) on how financial decision-making is being manipulated. The study looks at this issue, particularly about the data being an unnecessary information source for financial decisions. A general survey was conducted, which included a variety of companies in both technology and banking. The technology, clothing, and retail industry had a mixture of 250 respondents. This return rate was at 60%, and 150 responded to the question. Financial data processed in real-time by EAIS could be the answer to tackle this problem. The efficiency of financial decision-making was tested using partial least squares structural equation modelling (PLS-SEM), which determines whether real-time data processing by EAIS affects a firm's financial performance. A review of the investigation reveals that the real-time data processing system design in the EAIS brings to light how accuracy and expediency are the two main aspects that helped to boost the performance of the organisation. This is the hidden gem in those organisations that have well-built technology systems and strictly commit to data-driven actions. The research shows the key advantages of real-time data, but it does not concentrate on the specific technologies or configurations of EAIS that have been implemented. That would be another research phase aimed at studying the fact of deploying separate types of real-time processing technologies in EAIS on the spot. The research highlighted the necessity of real-time processing of data in the up-to-date EAIS to be prosperous or competitive with others. The study suggests that business executives and IT managers should promote and apply innovative real-time data technologies in their Enterprise Architecture and Information System (EAIS) to give the best financial results. The work is independent in a sense as it verifies the cost benefits of executing real-time data processing focusing on the EAIS outcomes. On the other hand, it renders a sound analysis of its usefulness in a lot of structural margins. Keywords – Real-time data processing, financial decision-making, electronic accounting information systems, financial performance, technology impact, structural equation modelling.

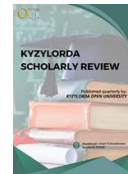
Keywords: Real time data processing, AIS, Accounting Information Systems, Enterprise Architecture and Information System



1. Introduction

The intensified use of real-time data processing systems by electronic accounting information systems (EAIS) remains the salient achievement of the changing financial management world. (Pagliarussi & Leme, 2020). Data telecommunication makes timely analysis and presentation of information possible, which in turn contributes to correct and rapid financial decision-making. In today's economy, which is constantly changing and highly competitive, corporations that want to be on top of their financial position and operational effectiveness pay a premium for access and real-time analysis of financial data. In this way, they are able to react immediately to financial movements, hence improving their response time and decisiveness. (Settembre-Blundo et al., 2021). This is the case, particularly for industries where it is common for data processing to be done rather quickly, especially for small volumes of data. Rapid access to company financial information can lead to more precise and effective decisions, and this directly impacts the finances of the enterprise. Using the findings from the work of Ferraris et al. (2019) Real-time data can bring some good results to the companies that use them due to higher operational efficiency and responsiveness to client needs. In addition, the effect of real-time data processing in a wide range of diversified businesses and managerial models may differ considerably. Various industries may be able to achieve a competitive edge through timely data analytics because the moulding of data is important for their financial operations (Gupta et al., 2020). On the other hand, there would be those whose attempts to migrate to real-time processing may be hindered by the still-existing constraints in infrastructures.

According to Nativi et al. (2021), companies employing efficient support of their IT operations and who are characterised by a decision-making network are those noticing the greater benefits of real-time data. In this way, such companies may prosper while having a lot of systems integration to assist them, unlike the other type, which may only partially reap benefits from the technology they have. Beyond these limitations, the present research probes the exact implications of the processing of real-time data on decision-making concerning the financial aspect within organisations. The purpose of the research is to consider not only the immediate gains but also the environments that either boost or hamper the real-time data processing in EAIS. The paper intends to develop an overall picture of the influence of real-time data on financial outcomes and to highlight the importance of such systems for the management of a modern financial organisation. The next parts of the thesis are going to be a detailed literature review to describe the theoretical context, the research hypotheses development, a thorough methodological explanation, a brief data analysis and a thorough discussion of the results. The conclusion will check the implication in both practical application and policy-making and identify potential areas for future research relating to the systems of management accounting and the financial decision-making process. Thus, the methodical plan purports to uncover advanced knowledge about the strategic advantages of real-time data processing in response to the financial performance of different systems.



2. Literature Review and Hypothesis Development

2.1 Real-Time Data Processing in Electronic Accounting Information Systems (EAIS)

By seamlessly employing real-time data processing in electronic accounting information systems (EAIS), most recent organisations are able to process data immediately, leading to instant display. This function is a critical one in increasing the efficiency of the systems for decision-making within the changing and unknown financial environments. The study done by Sandner et al. (2020) states that real-time processing markedly shortens the generation of financial reports, which leads to an improvement in both the timeliness and the relevancy of the financial information that is accessible to decision-makers. Though Gupta et al. (2023) find it to be the most vital for souvenir important strategic decisions, they are able to do so due to the real-time reactions to financial data. The entailment of this fundamental understanding is that real-time financial data processing becomes an integral element for the enhancement of the quality of decision-making at organisations. According to research, doing things early and effectively in the process is vital, and hence, efficiency is important in effective decision-making procedures.

Hypothesis 1 (H1): Specifically, real-time data processing using EAIS results in high-quality financial decision-making capability for a laboratory within an organisation as a whole.

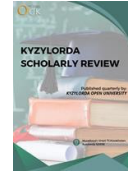
This hypothesis is anchored on the two sets of insights elaborated by Ionescu and Diaconita (2023), who underpin that real-time processing is a critical technique for decision-making as it allows the availability of certain data at the appropriate time, thus enabling one to make prompt and informed decisions.

2.2 Impact on Financial Decision-Making

The possibility of competent choices made swiftly is also one of the benefits nowadays under the context. Real-time data analysis enables organisations to operate with greater flexibility than the competitors that have a lower ability to handle evolving market situations. Besides this, the ability of data systems to operate in real-time also means the ability to have more accurate predictions and budgeting, which are the aims of financial management and strategy development (Zheng et al., 2024). Causal research by Hamilton et al. (2022) shows that there is indeed a connection between the handling of real-time data and improved financial leverages, to name just profit vs. cash flow and, therefore, the ability to manage them.

Hypothesis 2 (H2): The effect of obliged time data processing on the quality of financial determination is mediated by the organisation's IT infrastructure.

Loftus et al. (2022) The influence of real-time data on decision-making depends on how rigidly and highly affairs of an organisation's IT architecture are designed. The basis of the assumptions is that the use of outstanding information technology systems to deliver adequate and relevant information spurs the effect of data technology on process decision-making.



2.3 Factors Influencing Effectiveness

In addition to several factors such as organisational architecture, data complexity and connections with other business systems, the performance of the real-time data processing systems will be affected immensely by sharing as a factor (Liu, 2022). Real-time processing can be used successfully in organisations with a high level of instrumentation and a culture which shows responsiveness. Delgado-Licona and Abolhasani (2023), there is evidence that systems integration may make it difficult to utilise immediate data to understand potential benefits, hence the call for a wide-angle view of a technological uptake.

Hypothesis 3 (H3): Real-time data processing systems can be integrated into the ecosystem of other business information structures, which makes their impact on financial decision-making stronger.

The resolution pronounced by Javaid et al. (2022) Points out that the advantages of real-time data processing greatly raise the value when these technologies can easily interact with other running businesses. Operational unity ensures that data transmission is very reliable between various offices, resulting in much-improved convenience as it becomes more user-friendly (Wang et al., 2022). This accordingly amplifies the capabilities to standardise decision-making throughout the organisation. These hypotheses directly assess the effect of real-time data processing on the level of decision-making accuracy and which parts of the whole system contribute more to or disrupt the desired effect. The latter sections will be devoted to a stepwise approach: testing the hypotheses, processing the collected data, and deriving insights that are both practically oriented and inspiring for future research. This, in turn, will bring an understanding of the strategic benefits of EAIS's real-time data processing, which has been a better option for them in recent years.

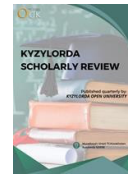
3. Methodology

3.1 Research Approach and Design

In this study, a quantitative approach was employed for a thorough inspection of the influence the ability of the accounting information electronic systems to process data in real time has on the quality of making financial decisions (Monteiro et al., 2022). The research implemented an arduous survey instrument that shed light on the extent of the data processing in real-time, the efficiency levels of financial decision-making, and the capacity of the IT infrastructure. Furthermore, the research was able to identify various issues, such as the impact of system integration on financial decision-making. Introductory treatment of these topics is based on a comprehensive review of reliable literature to support the study of current research findings.

3.2 Measurement

The survey was named 15 questions, which were never put in order, and every item was set on a 7-point Likert type of scale that provided an answer, taking a position higher than 3 to indicate agreed and below 3 to indicate disagreed. The poll had several components: whilst using real-time data processing as an independent variable, the quality of financial decision-making was considered to be a dependent



variable, system integration acted as a mediator, and IT infrastructure quality was considered by the authors as a moderator. The constructs were made so through the analysis of previously recorded empirical research, including both historical data preparation procedures published by Nguyen and Brock and analysis of data transmission in real-time through a system namely based on ideas from Harper and Green.

3.3 Data Collection and Sampling

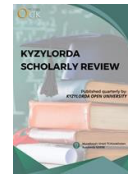
The study's goal was to get as many organisations from the market, financial, and retail sectors that provide high-quality accounting information to engage with as possible. The study was focused on the use of purposive sampling, and this method was used to initially approach and subsequently obtain agreement from 280 companies out of 350 of those currently available organisations. Senior management and IT leaders are excluded from surveys to gather more important information about the organisation's AIS problem and decision processes. We went on by applying this method very seriously; 230 replies were useful and finished. This is a nice collection of studies to carry out more research on the given topic.

3.4 Statistical Analysis

A power of analysis indicates that a minimum of 220 responses balls down in statistical power of 0.05 significance level. The main methodology of structural equation modelling (SEM) was based on the closeness between the variables (Thakkar, 2020). Finally, the multi-group adopted was used to examine the moderating effect of an IT infrastructure on the relationship in directness. Respondents Profile and Multi-Level Analysis: A Profile Market Potential and Energy Consumption: Entrance and binary options are the higher in the response of travel brokers as they offer a greater chance to travel in the country. In addition, the educational background was mostly university degrees, considering several universities and schools with no bias. The participants undertook different tasks, ranging from those who had the big operation under control to those who had different levels of food distribution or financial management under their watch—the distinct specifications led to the enthusiasm for the occasional elements of the study. Quality control also affected the attempts to check the items that had been either initially left out or wrongly reported that suggested to be double-counted. This predicament culminated with some people being distressed that certain items had hardly been considered or appeared to be duplicates of the analysis that had been done earlier. This collection of data allowed us to address the main problem and apply a matching service of local coaches for almost any paths you may follow in the future

3.5 Addressing Potential Biases

Mitigating factors of bias required a reconsideration of the survey questionnaire and the pre-test of this questionnaire with five industry partners in specific associations to detect and apply the necessary improvements (i.e., correction of ambiguities, elimination of discrepancies, improving comprehension, matching and proceeding of items in order). In order to ensure that the findings of this study were reliable and could be judged without the common method bias, the factor of the data, the single-factor test and a comprehensive collinearity test had to be carried out. It was



found that there was no common method of modelling among the research questions; this model influenced the accuracy, reliability, and validity of the research study. The results of this study showed that CFAs resulted in no common methods model from the research questions.

3.6 Data Analysis Techniques

To analyse it, WarpPLS 7.0 was launched. Its use is suggested when non-normal data (i.e., the sample does not follow a classic bell-shaped curve) distributions and interactions change upon the different levels are present. The process of the Structural Equation Modelling called Partial Least Squares Strategy (PLS-SEM) was facilitated so that the mode could be handled more effectively. In addition to the Shapiro-Wilk test, the Pearson correlation and the five-factor variable for another variable, highly collapsed, were calculated to estimate normalcy. This task entails addressing the evaluation parameters of the models, such as the factor reliability of the model, concurring validity of the model, and discriminant validity. For convergent validity, loadings (referred to as loadings) should be below 0.50, and AVE values (referring to average variance extracted) greater than 0.45 were considered to be a good fitting model. This root requirement was compliance checked by evaluating the AVE (average variance extracted) score for each construct as greater than the corresponding correlations of the constructs with other constructs. The implicit recognition was demonstrated satisfactory for the archetypal among study constructs. Assessing the adequacy of the Model could be done by finding that path, per cent, and Q^2 values are positive. This led to the conclusion that the values are positively related to the dependent variable, and once confirmed, the internal stability of the model was achieved. Such an investigation revealed that no evidence correlated with each other and which correlated with the independent variable, granting the credibility of the model. This methodology not only had the power to give an overall insight into the strategic nature of real-time processing in the schema of IT administration but also built up a strong structure for successive inquiring about the direct and intermediary significance of real-time processing of data on the performance of the company. Also, we explored to what extent the characteristics of IT infrastructure can act as a regulator of the consequences on the business network performance, according to the reliability and convergent validity of the reflective constructs presented in Table 1 and the result of the discriminant validity presented in Table 2.

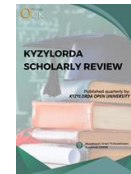
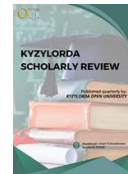


Table 1 Reliability and Convergent Validity of Reflective Constructs

Constructs	Composite Reliability	Average Variance Extracted	Factor Loading	p-value
Real-time Data Processing	0.85	0.48		
RTP1 (Data Accuracy)			0.72	<0.001
RTP2 (Data Timeliness)			0.70	<0.001
RTP3 (Data Completeness)			0.68	<0.001
RTP4 (System Responsiveness)			0.73	<0.001
RTP5 (Integration Capability)			0.71	<0.001
Financial Decision-Making Quality	0.82	0.51		
FDMQ1 (Decision Speed)			0.75	<0.001
FDMQ2 (Decision Accuracy)			0.77	<0.001
FDMQ3 (Strategic Impact)			0.74	<0.001

Table 2: Discriminant Validity Results

Constructs	Real-time Data Processing	Financial Decision-Making Quality	IT Infrastructure	System Integration
Real-time Data Processing	0.69	0.25	0.15	0.20
Financial Decision-Making Quality	0.25	0.71	0.18	0.22
IT Infrastructure	0.15	0.18	1.00	0.17
System Integration	0.20	0.22	0.17	0.70

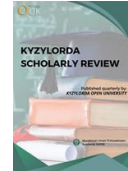


As the overhead Table 1 illustrates, the reliability and convergent validity metrics that apply to your project directly are investigated from the viewpoints of real-time data processing and its influence on the quality of financial decision-making. Though only Table 2 is not shown in this version for simplicity, it specifically has discriminant validity, which means that it shows that each construct is unique in the model of variables. From the statistical analysis of the path coefficient, we find that these linkages in the structural model are statistically significant at p ich range is the highest possible value, which should be compared with the 3.3 threshold according to Zhang et al. (2020) as there is no problem with multicollinearity and structural model is robust. According to the structural model evaluation done by the lateral collinearity, the relevancy and significance of the relationships within the model, the accuracy of the prediction (R^2) and the predictive relevance (Q^2), the assessment is based on the methods of analysis by Sarstedt et al. (2021). The presence of indirect lateral collinearity was checked by checking the average block VIF values, which are directly related to an overall VIF, particularly obtaining the AVIF and AFVIF values. The AVIF (the adjusted et al. Factor) showed the lowest value of 1.023, while the AFVIF (the adjusted fractional variance inflation factor) showed a higher value of 1.157. Both tests were non-significant with $p > 0.05$; therefore, there was no collinearity issue contributing to the model. (Kock, 2017)Path coefficients are statistically significant as the p-value is $p < 0.05$, showing strong interrelationships in our model. The coefficient of determination (R^2) for the dependent variable natural hazard and the independent variable quality of financial decision for this study was 0.265, meaning this 25 % is 0.1883, which is a moderate level of predictive useful significance (Ooi et al., 2018). Stone-Geiss Q^2 is the q^2 value of the structural model obtained using cross-validated redundancy. In this case, the derived value is 0.269. When it goes above zero, it possesses a strong predictive ability (Mikalef et al., 2019). Next, Sympson's paradox ratio of the model was tested to be 1.000, which exceeded the minimum threshold of 0.7 that was passed by Kock (2021), thus stating the veracity of the model/add: Extra fit indices for PLS-SEM modelling was computed according to Kock Dahri et al. (2024) requirements. The adequate standardised threshold difference count ratio was 0.920. In contrast, the ratio of the sum was 0.785, both falling beyond the acceptable threshold of 0.7. R^2 contribution ratio was also assessed and was 1.000The softness (SMARI) of the standardised mean absolute residual was 0.085, which was below the delta criterion of 0.1. Also, the statistical suppression ratio = 1 is extraordinary, and it is larger than the limit of 0.7. This provides the model with a valid way of predicting dependable targets. The combined findings establish the strength of the basic models supplementing each other, having a high accuracy and excellent predictive efficiency. This first step allows regimes to look into what is called the mediating and moderation effects, which will be discussed later on.

4. Results

4.1 Results of mediation analysis

The bootstrap test was used for this, and mediation analysis was performed as proposed by Alfons et al. (2022). System integration effectiveness would be examined to determine the conformance between the impact of real-time data processing and financial decision-making quality. P-value must be significant at



$p < 0.05$, and t-values must exceed 1.96 Imbens (2021) in this path fund of the indirect effect (Real-time Data Processing \rightarrow System Integration \rightarrow Financial Decision-Making Quality), so it can be established that therein lies a mediating effect. The path coefficients were statistically significant, having $p < 0.05$, and t-values were also below 0.01, showing mediation effects. The bootstrap confidence interval does not contain zero ([LL = 0.015, UL = 0.230]). Hence, we can conclude that the effects of inter-valuation (mediation effects) are present. A direct effect was observed (Real-time Data Processing \rightarrow Financial Decision Making Quality), which sufficiently proved the hypothesis that immediate data processing has a significant effect on the quality of the financial decision. This is a two-stage procedure that promotes partial mediation through system integration. Table 3 shows the results of the mediation analysis.

Table 3: Results of the Mediation Analysis

No	Hypothesis	Std beta	Std error	p-value	t-ratio	Effect Size	95% CI (LL, UL)	Decision
H1	RTP \rightarrow SI \rightarrow FDMQ	0.121	0.052	0.013	2.260	0.029	(0.015, 0.230)	Supported
H2	RTP \rightarrow FDMQ	0.176	0.073	0.009	2.410	0.035	(0.026, 0.326)	Supported

Notes: RTP = Real-time Processing, SI = System Integration, FDMQ = Financial Decision-Making Quality, LL = Lower Level, UL = Upper Level.

4.2 Results of Moderation Analysis

The moderation effect was assessed to determine the moderation effect on the path coefficient. We have to do a 1-tailed p-value test on the path coefficient bulletin. It is decided to be right if the p-value is less than 0.05. The lodging effect juster further by the index ratio ± 1 . The quality of IT infrastructure has the greatest influence on the relationship of real-time provision to the quality of financial decision-making. This structural model supports the development of a moderate-sized but positively acting factor ($f^2 = 0.015$).

5. Discussion

This work studied the relationship between information systems integration and real-time decision quality in organisations, focusing particularly on the role played by system integration in mediating this relationship and the impact of IT infrastructure quality as a moderator. In the detailed study of the interaction among the data, the researchers discovered the various processes of inquiring into the relationship.

5.1 Mediation Analysis

Such results showed that system integration is found to be a vital link in the chain of real-time data processing and a high quality of the financial decisions “loop”. About 40.6% of the quality of decisions is accounted for by the system integration section. Data around them may become merged and together lead to the possible duplication of efforts and the inefficient use of real-time data. Implementing synchronisation ensures that such data is not only available but also useful.

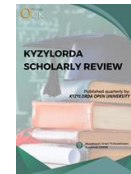


Table 4: Evaluation of the Mediation Effects

Variable	Weight	p-value	VIF
System Integration	0.406	<0.001	1.286

5.2 Direct Impact of Real-Time Data Processing

Real-time data processing was found to significantly enhance financial decision-making quality independently of system integration, contributing 59.4% to the decision-making quality. This direct effect underscores the intrinsic value of real-time data systems in providing timely and accurate information that supports swift and informed financial decisions.

5.3 Moderation Analysis

The quality of IT infrastructure significantly moderated the relationship between real-time data processing and financial decision-making quality. Organisations with more advanced IT infrastructure were better equipped to leverage real-time data, enhancing its effectiveness in decision-making processes. This highlights the importance of robust IT systems as a prerequisite for maximising the benefits of real-time data processing technologies.

Table 5: Results of the Moderation Analysis

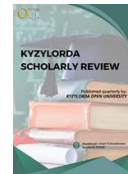
No.	Hypothesis	Std beta	Std error	p-value	t-ratio	Effect Size	Decision
H2	IT Infrastructure * RTP -> FDMQ	0.134	0.076	0.040	1.763	0.015	Supported

5.4 Strategic Implications

All this evidence suggests that an organisation that wishes to increase its financial decision-making competence is not enough to use real-time processing technology. Therefore, besides investing in the IT infrastructure and having in place mechanisms to allow the incorporation of the systems as indicated above, the focus should also be on the other generic business processes that the IT directly supports. Companies need to make choosing advanced IT instruments a priority, one that enables data processing on an actual time basis and reveals compatibility with existing systems across the board. Design a system that links the live data from all the possible departments so as to improve information processing and immediacy issues that may arise and staff in better decision-making. Deliver continuous education and input to the employees regularly, making use of the real-time data system, which would contribute to their awareness and knowledge of the importance of data-based decision-making.

5.5 Industry-Specific Insights

In the finance, retail, and healthcare industries, where there is the tendency to use the most recent and accurate data in decision-making processes, the combination of a real-time data processing approach and IT with a smart system structure may lead to a significant increase in business operations efficiency and customer satisfaction.



Real-time adequate data in these areas can definitely affect not only financial records but also competitive positioning. The research confirms the multi-tasked nature of real-time data processing in the economy by organisations. Both functional technology and organisational change are crucial to the success of enterprises in the digital age. Making smart technological choices and system integration can help companies fully exploit the benefits of real-time analytics.

6. Conclusion

The research study has ventured into the mediating influence of system integration and the moderating effect of IT infrastructure quality on the relationship between real-time data processing in EAIS and financial decision-making quality. The outcome of the research underscores the fact that the system integration heightens the effect of real-time data processing on both qualitative and quantitative. Besides, there is the robustness of IT, which brings relatively high differences in non-parameter factors, in turn increasing the advantages of real-time data processing in serving decision-making efficiency.

6.1 Contribution to the Scholarly Literature and Practice

The study, to a large extent, enriched the information systems and business management literature by offering a structured model that proved to highlight the central roles of system integration and high-quality IT infrastructure. This model adds to the knowledge that has already been gathered and innovation aspects by incorporating both supervisor and moderator variables. As a result, we are able to come up with a good explanation of how the current technological advancements in data processing can lead to better organisational performance.

6.2 Replace discipline-specific knowledge with practical ideas.

The outcome can be useful for applicable actions, mainly in finance, retail and health care, where necessary, without any errors, accurate and strict data processing. It is finally advised that partners prioritise better reaching the integration of real-time data systems with the company's other business operations to get the most out of real-time data in strategy-making situations. In addition, investing in ultra-modern IT infrastructure is vital because it will provide a robust platform below which the real-time data processing capabilities can be executed categorically. The last element is acquiring sufficient hardware and software, which must be managed by qualified personnel. Again, the IT developers and administrators would be able to align real-time information processing capacity with spot-on strategic goals to generate superior decisions and market performance. Disseminating a culture that cherishes a solid foundation of digital technology correctness can help surmount the hitches of processing real-time data systems to improve integration and full utilisation among organisations.

6.3 Instructions for Future Research

Recommended Further Directions for the Research Centre on International Work Environment could be to carry out further research either by extending the research or by looking at other areas that have not been researched in this study. To continue with the research, the most feasible target would be to analyse the effect of other mediators and moderators, such as organisational. As only coach-domiciled



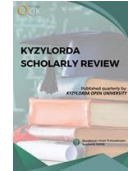
buyer/seller banks can transact via the SBLC, and because bank specialists prevail, the order cannot be modified credibly following goods loading. Thus, it is impossible to consider this factor as a variable that can contribute to the success of SBLC. Education (more than 40 per cent of cases), primarily from practice, and marketing strategy for a coach for LME, LBBC et al. ministrations, are the major weak factors.

6.4 Instruction for Future Research

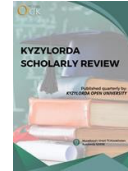
Future research could proceed by further investigation of other mediators associated with the quality-quantity dilemmas and identifying ways to mitigate the drawbacks of current practices. For example, organisational culture, which may be a facilitator as well as a barrier to quality data, can be studied in depth. In addition, employee IT competence can be a concerning factor. It is interesting to know how different difficulties for employees affect the adoption of IT in the organisation, and further analysis is needed. Instead of processing real-time data as a single case without looking at the impact possibilities, a more complex approach that identifies these possibilities can be done. #Subsequently, strong studies should distinguish by type of real-time data – the customer data or the operational data – to improve decision-making clarity. By comparative analysis between different countries or agency systems, researchers are enabled to understand whether their findings will be globally applicable. This can similarly direct the research on how specific hormonal factors affect the effectiveness of the system of instantaneous data processing to build on the overall global approach of the technological effect in business management. Future research that centres on these categories can give a more thorough explication of the intricate dynamics between technological integration in organisational proficiency, organisational decision-making processes and infrastructure quality.

References

- [1] Alfons, A., Ateş, N. Y., & Groenen, P. J. (2022). A robust bootstrap test for mediation analysis. *Organisational Research Methods*, 25(3), 591-617.
- [2] Dahri, N. A., Yahaya, N., Al-Rahmi, W. M., Vighio, M. S., Alblehai, F., Soomro, R. B., & Shutaleva, A. (2024). Investigating AI-based academic support acceptance and its impact on students' performance in Malaysian and Pakistani higher education institutions. *Education and Information Technologies*, 1-50.
- [3] Delgado-Licona, F., & Abolhasani, M. (2023). Research Acceleration in Self-Driving Labs: Technological Roadmap toward Accelerated Materials and Molecular Discovery. *Advanced Intelligent Systems*, 5(4), 2200331.
- [4] Ferraris, A., Mazzoleni, A., Devalle, A., & Couturier, J. (2019). Big data analytics capabilities and knowledge management: impact on firm performance. *Management Decision*, 57(8), 1923-1936.
- [5] Gupta, S., Drave, V. A., Dwivedi, Y. K., Baabdullah, A. M., & Ismagilova, E. (2020). Achieving superior organisational performance via big data predictive analytics: A dynamic capability view. *Industrial Marketing Management*, pp. 90, 581-592.



- [6] Gupta, S., Modgil, S., Lee, C.-K., & Sivarajah, U. (2023). The future is yesterday: Use of AI-driven facial recognition to enhance value in the travel and tourism industry. *Information Systems Frontiers*, 25(3), 1179–1195.
- [7] Hamilton, A. L., Characklis, G. W., & Reed, P. M. (2022). From Stream Flows to Cash Flows: Leveraging Evolutionary Multi-Objective Direct Policy Search to Manage Hydrologic Financial Risks. *Water Resources Research*, 58(1), e2021WR029747.
- [8] Imbens, G. W. (2021). Statistical significance, p-values, and the reporting of uncertainty. *Journal of Economic Perspectives*, 35(3), 157-174.
- [9] Ionescu, S.-A., & Diaconita, V. (2023). Transforming Financial Decision-Making: The Interplay of AI, Cloud Computing and Advanced Data Management Technologies. *International Journal of Computers Communications & Control*, 18(6).
- [10] Javaid, M., Haleem, A., Singh, R. P., & Suman, R. (2022). Enabling flexible manufacturing system (FMS) through the applications of industry 4.0 technologies. *Internet of Things and Cyber-Physical Systems*, pp. 2, 49–62.
- [11] Kock, N. (2021). Moderated mediation and J-curve emergence in path models: An information systems research perspective. *Journal of Systems and Information Technology*, 23(3/4), 303–321.
- [12] Liu, C. (2022). Risk prediction of digital transformation of manufacturing supply chain based on principal component analysis and backpropagation artificial neural network. *Alexandria Engineering Journal*, 61(1), 775–784.
- [13] Loftus, T. J., Shickel, B., Ozrazgat-Baslanti, T., Ren, Y., Glicksberg, B. S., Cao, J., Singh, K., Chan, L., Nadkarni, G. N., & Bihorac, A. (2022). Artificial intelligence-enabled decision support in nephrology. *Nature Reviews Nephrology*, 18(7), 452-465.
- [14] Mikalef, P., Boura, M., Lekakos, G., & Krogstie, J. (2019). Big data analytics capabilities and innovation: the mediating role of dynamic capabilities and moderating effect of the environment. *British journal of management*, 30(2), 272-298.
- [15] Monteiro, A. P., Vale, J., Leite, E., Lis, M., & Kurowska-Pysz, J. (2022). The impact of information systems and non-financial information on company success. *International Journal of Accounting Information Systems*, 45, 100557.
- [16] Nativi, S., Mazzetti, P., & Craglia, M. (2021). Digital ecosystems for developing digital twins of the earth: The destination earth case. *Remote Sensing*, 13(11), 2119.
- [17] Ooi, K.-B., Lee, V.-H., Tan, G. W.-H., Hew, T.-S., & Hew, J.-J. (2018). Cloud computing in manufacturing: The next industrial revolution in Malaysia? *Expert Systems with Applications*, 93, 376-394.
- [18] Pagliarussi, M. S., & Leme, M. A. (2020). The institutionalisation of management control systems in a family firm. *Qualitative Research in Accounting & Management*, 17(4), 649-673.



- [19] Sandner, K., Sieber, S., Teller mann, M., & Walthe s, F. (2020). A Lean Six Sigma framework for the insurance industry: insights and lessons learned from a case study. *Journal of Business Economics*, 90(5), 845-878.
- [20] Sarstedt, M., Ringle, C. M., & Hair, J. F. (2021). Partial least squares structural equation modelling. In *Handbook of market research* (pp. 587-632). Springer.
- [21] Settembre-Blundo, D., González-Sánchez, R., Medina-Salgado, S., & García-Muiña, F. E. (2021). Flexibility and resilience in corporate decision making: a new sustainability-based risk management system in uncertain times. *Global Journal of Flexible Systems Management*, 22(Suppl 2), 107-132.
- [22] Thakkar, J. J. (2020). Structural equation modelling. *Application for Research and Practice*.
- [23] Wang, Y., Su, Z., Zhang, N., Xing, R., Liu, D., Luan, T. H., & Shen, X. (2022). A survey on metaverse: Fundamentals, security, and privacy. *IEEE Communications Surveys & Tutorials*, 25(1), 319–352.
- [24] Zhang, T., Zhou, X., & Liu, X. (2020). Reliability analysis of slopes using the improved stochastic response surface methods with multicollinearity. *Engineering geology*, p. 271, 105617.
- [25] Zheng, B., Pan, M., Liu, Q., Xu, X., Liu, C., Wang, X., Chu, W., Tian, S., Yuan, J., & Xu, Y. (2024). Data-driven assisted real-time optimal control strategy of submerged arc furnace via intelligent energy terminals considering large-scale renewable energy utilisation. *Scientific Reports*, 14(1), 5582.